CLAIMS

1. A magnetic axial bearing arrangement in a reciprocating hermetic compressor, comprising: a cylinder block (20) mounted inside a shell (10) and carrying a cylinder (30) and a vertically disposed radial bearing hub (40); a crankshaft (50) mounted through the radial bearing hub (40) and having a first end portion projecting outwardly from the radial bearing hub (40) and securing a rotor (61) of an electric motor (60), and an opposite second end portion projecting outwardly from the radial bearing hub (40) and incorporating a peripheral flange (51) and an eccentric portion (52), characterized in that it comprises at least one magnetic axial bearing assembly (100) composed of magnet elements (101) with mutually confronting faces, each magnet element (101) being mounted to a respective part of at least one of the pairs of parts of crankshaft (50) and cylinder block (20) and of cylinder block (20) and rotor (61), there being provided, in at least one of the pairs of parts, confronting mechanical stops which are maintained spaced apart by an axial gap (FA) smaller than a magnetic axial gap (FM) existing between the confronting faces of the magnet elements (101) in order to guarantee that, upon occurring at least one of the conditions of a sufficiently high increase of the compressor temperature and an axial displacement of said parts during transportation of the compressor causing the mutual seating of the confronting mechanical stops, the magnetic axial gap is maintained higher than zero.

2. The arrangement as set forth in claim 1, characterized in that it comprises an external bearing (120) which is seated on the cylinder block (20) and operates on an extension of the crankshaft (50),

external to its eccentric portion (52), and in that between said cylinder block (20) and external bearing (120) is disposed a magnetic axial bearing assembly (100).

3. The arrangement as set forth in claim 1, <u>characterized</u> in that at least one of the confronting mechanical stops defines an annular sliding bearing disposed around the crankshaft (50).

4. The arrangement as set forth in claim 3, <u>characterized</u> in that at least one of the confronting mechanical stops is incorporated to one of said parts (50, 20; 20, 61).

5. The arrangement as set forth in claim 1, <u>characterized</u> in that at least one of the confronting mechanical stops is defined by an insert secured to and projecting from one of said parts (50, 20; 20, 61).

6. The arrangement as set forth in claim 1, <u>characterized</u> in that the magnet elements (101) of a magnetic axial bearing assembly (100) are seated in a lowered portion of an end of the radial bearing hub (40), the other magnet element (101) of the same pair being seated against an adjacent surface portion of the peripheral flange (51), said end of the radial bearing hub (40) defining a confronting mechanical stop and the peripheral flange (51) defining the other confronting mechanical stop of the pair of said confronting mechanical stops which are disposed radially internally in relation to said pair of magnet elements (101) and have the axial gap (FA) thereof axially leveled with the magnetic axial gap (FM) of said pair of magnet elements (101).

7. The arrangement as set forth in claim 6, in which the crankshaft (50) comprises, on its external surface, at least one superficial oil channel (53),

having an oil inlet lower end in fluid communication with an oil reservoir defined inside the shell (10) and an oil outlet upper end (53a) opened to the lower end of an oil channel (54) defined along the eccentric portion (52), characterized in that it comprises a deflecting means carried by the crankshaft (50) itself and disposed so as to conduct to the inside of the oil channel (54) most of the ascending oil flow reaching the oil outlet upper end (53a) of the superficial oil channel (53), minimizing the centrifugal radial escapes of said ascending oil flow in the region of the adjacent end of the radial bearing hub (40).

8. The arrangement as set forth in claim 7, characterized in that the deflecting means is defined by an axial wall portion (55) of the crankshaft (50), provided between the oil outlet upper end (53a) of the superficial oil channel (53) and the lower end of the oil channel (54) of the eccentric portion (52), said axial wall portion (55) extending along the crankshaft (50) at least in the region of the adjacent end of the radial bearing hub (40).

9. The arrangement as set forth in claim 8, characterized in that it comprises an oil passage (56) defined inside the crankshaft (50) and which is internal to and spaced from the peripheral contour of the latter, having an upper end portion opened to the lower end of the oil channel (54) and a lower end portion opened to the oil outlet upper end (53a) of the superficial oil channel (53), the peripheral contour of at least one of the parts of oil passage (56) and oil channel (54) defining an internal contour for the axial wall portion (55).

10. The arrangement as set forth in claim 9, characterized in that the oil channel (54) has part of its extension provided inside the crankshaft (50).

11. The arrangement as set forth in claim 7, characterized in that the oil deflecting means is in the form of a conduct (110) disposed inside the oil channel (54), having an end (111) opened to the oil outlet upper end (53a) of the superficial oil channel (53) and an opposite end (112) opened to the inside of the internal oil channel (54), the end (111) opened to said oil outlet upper end (53a) being axially spaced from a lower plane of the magnetic axial gap (FM) between said magnet elements (101).

12. The arrangement as set forth in claim 1, characterized in that at least one magnet element (101) is retained to one of said parts by at least one of its radially internal, radially external and end faces.

13. The arrangement as set forth in claim 1, characterized in that the magnet elements (101) are obtained by a mixture of magnetic material and polymers in order to adjust the supporting capacity to minimum dimensions of the magnet elements (101).